Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

white cloud of vapours, similar to a vast snow bank envelopes above an hundred feet of the lower part of the sheet, so as to render it quite invisible.

Whenever the sun shines, beautiful rainbows are seen in the ascending cloud or vapours, which constantly arise from the bottom of the falls in such vast quantities, as to produce a continual fall of rain for a considerable distance around; which in the winter season being congealed into ice, makes a most beautiful crystalline appearance in the trees of the adjacent forests.

About six miles below the falls, I viewed the great whirl in the river, or rather in the side of the mountain; which I was told was a curiosity nearly equal to the falls. The cause of this curious phenomenon, is a right angle or short turn in the river, immediately above which is a very strong roaring rapid, which rushing violently down against the opposite shore, has in the course of time worn away perhaps three or four hundred acres. Within this eddy or chasm, are collected great quantities of drift wood, from whence I believe it seldom escapes, and floating continually round in the gulph, shows the rapid whirling motion of the water. It is encircled by a perpendicular rock about 300 feet high; standing on the top of this rock, I viewed with humble fear, perfect horror and surprise, the awful yawning, whirling gulph beneath!

Perhaps the state of New-York contains more natural and artificial curiosities than any other in the Union, many of which are nearly arranged in a direct rout from New-York to the Niagara falls. The Hudson's river with its steam boats, and numerous other vessels; the many flourishing towns and cities on its banks; with the beautiful, lofty Kaatskill mountains, and the great falls (called the Cohooz) on Mohawk river certainly exhibit an agreeable, entertaining, and picturesque scene to the traveller. The Believers or Shakers meeting at Niskaunia, where singing and dancing constitute the solemn worship of a christian church, I have visited with admiration. The medicinal waters of Ballstown spa, are, I presume, equal to any in the world; and the salt springs at Anauga are better than any I know of. The great fresh water spring, forty miles long, and several miles wide, called Seneca Lake, which never freezes, must be very extraordinary in that cold country. The great fishery at Black-rock, on Niagara river, is one of the best discovered in fresh water.

"All are but parts of one stupendous whole,
Whose body nature is, and God the soul."

DAVID COOLEY, JUN.

Benington, State of Vermont, 1810.

For the Belfast Monthly Magazine.

ON THE POISON OF LEAD; BY A. FOTHERGILL, M.D. F.R.S. EXTRACTED FROM AN ESSAY ENTITLED, "CAUTIONS TO THE HEADS OF FAMILIES."

THE extensive use of lead in various forms, enables it to assail all the avenues of life. Sometimes it attacks the human frame by an open assault, but more frequently it makes inroads into the constitution as a secret unsuspected enemy. Various causes conspire to favour its introduction into the system. The arts of chemistry, of medicine, and even of cookery, have all successively lent their aid, insomuch that no person of whatever rank or station, from the prince to the peasant, can, at all times, pronounce himself perfectly secure against its silent depredations. Devoutly therefore, not ludicrously, may we now exclaim with Sir John Falstaff,

"Heavens, keep lead out of us!"

The jovial knight, like a *bon-vivant* of the present day, not dreaming of its admission into his body by any mode but one, viz. that of a leaden-ball, continued to quaff his sack in seeming security, while each draught probably contained a portion of the detested metal which he so piously deprecated. For our ancestors in those days were no novices in the mystery of refining liquors with lead, though by no means such able adepts as their successors, who (to do them justice) appear to have carried the art to its *ne plus ultra.*

Though the above apprehensions to some may seem imaginary, or at least exaggerated, yet whoever attentively considers the well-authenticated facts adduced by Sir George Baker, Dr. Percival, and other eminent authors, concerning this poison, will soon be convinced that they are but too well founded, and consequently that these cautions are not altogether superfluous. Seldom do the common people err through excess of caution, but often through the want of it. Few of them indeed have leisure or inclination to trace this subject through a variety of medical volumes. The following admonitions, therefore, are not addressed to the medical faculty, but to the heads of families, whose duty it is to watch over the health of those committed to their charge.

Lead in every form is unfriendly to animal and vegetable life. The miners who dig the ore, the smelters who reduce it to a metallic state, manufacturers of white lead, painters, plumbers, in a word, all who are much exposed to its effluvia, bear testimony to its pernicious effects. Its fumes are found no less destructive to domestic animals, such as dogs, cats, fowls, &c. nay, even vegetables in its neighbourhood soon lose their verdure; nor can plants thrive in pots composed of this metal. Its various preparations, as litharge, red and white lead, are all poisonous, and their activity is increased by their union with acids. Lead unfortunately being thus liable to be corroded, or even dissolved by almost every species of acid, the dangerous consequences are proportionably increased. For it not only unites with the stronger mineral acids, but also with those of the weaker vegetable kind, as that of wine, beer, cyder, vinegar, verjuice, &c. to which it imparts a manifest sweetness, forming a salt termed sugar of lead. Hence the foundation of that most dangerous abuse of correcting acid wines and cyder with litharge, or other preparations of this metal. Lead also unites with expressed oils, and other unctuous bodies, as butter, suet, lard, &c.

Hence in Holland it has been customary to correct the more offensive expressed oils, so as to substitute them for oil of olives, or almonds, by impregnating them with lead. Another horrible abuse, and which merits the most exemplary punishment! Deliberately thus to adulterate the common articles of life with a slow poison, and wantonly to sacrifice the lives of innocent persons to unfeeling avarice, seems a refinement in villainy at which human nature revolts, and which could hardly be credited in a christian country! The savage tribes of the most barbarous nations, who attack their declared enemies with poisoned arrows, are never known to discharge them at their unoffending neighbours and countrymen.

To such an alarming pitch had the dangerous art of adulterating liquors with lead arrived in France, that at length it became necessary to make it a capital offence. I am unwilling to believe that any man would presume to practise this inhuman fraud, were he fully apprised of the poisonous nature of the ingredient. That none of my readers may plead ignorance, I shall briefly mention its principal effects.

This metallic poison is powerfully styptic, and highly injurious to the nerves, hence it suppresses the natural intestinal discharges, producing obstinate costiveness, and a peculiar species of colic terminating in palsy of the extremities, which generally deprives them of motion, without destroying their sensation. These symptoms, being the genuine effects of lead, seem to mark its specific power, and to distinguish it from every other poison.

It moreover occasions a pale, sallow countenance, contraction and wasting of the muscles, numbness, tremors, languors, convulsions, epilepsy, and death.—These symptoms vary according to the quantity of the poison, the state of the body, the irritability of the system, and other circumstances. Sometimes, without producing spasms or other violent symptoms, it only occasions a slow lingering indisposition, which, however, lasts some years, and at length generally eludes the power of medicine. This well accords with what has been transmitted to us concerning the slow poisons of the ancients, and seems to confirm the suspicion that their basis was no other than a secret calx of lead.—May this fatal calx long rest in oblivion, and never more be revived!

This poison may be received into the body in diet, and in medicine.

1. *Diet*.—Water, which constitutes so large a proportion of diet in every nation, is generally conveyed through leaden pipes, or cylinders of pumps, and is often left to stand in leaden cisterns. As these have sometimes been found corroded in certain places, by *Newmann* and other chemical writers, it has been suspected, and not without reason, that the water might thus receive a slight impregnation from the metal.—*Galen* and *Vitruvius* loudly condemn leaden pipes for the purpose of conveying water, because their internal surface contracts a covering of white lead. *Dr. Heberden* kept water in which lead had been immersed twelve years: the water exhibited a whitish powder at the bottom, and gave a brown tinge to a solution of orpiment, and volatile tincture of sulphur—proofs of the presence of lead. *Sir George Baker*, however, repeated the experiment by keeping water in a leaden tube, but at the end of the two months the water discovered no sensible impregnation by the above tests. He relates however, on the testimony of *Dr. Wall*, that a family in Worcester suffered a long tedious indisposition, with some symptoms of this poison, in consequence of daily using a hard aluminous water. On examining the pump, the leaden cylinder was found corroded, and even perforated by the water, although it had been repaired only three years before. On removing to another house supplied with better water, the family at length recovered their wonted health. From these facts it would appear that water, under certain circumstances, is capable of corroding lead, so as to prove injurious to health. Some authors affirm, others positively deny this conclusion. Pure water, it is true, is no menstruum for lead, but rarely do we meet with water that is pure. Pump or spring water is generally impregnated with a small portion of vitriolic or marine salt, but lead is hardly capable of detaching these acids from an alkaline or earthy basis, and therefore cannot communicate any poisonous quality to the water: hence this metal, though immersed in a solution of alum, remains unchanged. Nor can

the aërial acid enable water to act upon lead. But should the water contain any mineral or vegetable acid, uncombined with earth, a circumstance which rarely occurs, it may then, though in a very dilute state, corrode the metal sufficiently to produce mischievous effects. This seems actually to have been the case at Worcester. For it certainly must have been an acid, not alum, that corroded the lead.—This may suggest to us the following cautions:

1st. That whenever water betrays any sensible mark of acidity, by an aluminous taste, or by changing syrup of violets red, such water, if meant for internal use, ought never to come in contact with lead.

2d. Water conveyed from the leaden gutters of houses, or standing long in leaden cisterns exposed to falling leaves, from which it may acquire an acid quality, is alike exceptionable. To this cause, *M. Tronchin* attributed the epidemic colic which some years ago prevailed at Amsterdam.

It is worthy observation, that the endemial colic, which formerly was wont to infest the inhabitants of Poitou, so as to become proverbial, is now no longer known, since the practice of adulterating wines has been abolished from that district.

Notwithstanding the severity of the laws, the fatal abuse still prevails, particularly in many parts of France and Germany, where their weaker wines, being prone to acidity, are still, corrected with litharge, or sweetened with sugar of lead! Nor is this wholly confined to the lower white-wines, such as the Rhenish, and the Moselle, for in a late French publication, intitled La Maison Rustique, a large ball of lead is piously directed to be suspended in the cask in order to prevent the wines of *Burgundy* from turning acid! At Paris, the low meagre wines commonly sold to the populace are made to run through a leaden channel, and are distributed to the customers in measures composed of tin, or base pewter containing a large portion of lead. Accordingly the colic of Poitou is still predominant in Paris. *Dr. Gadane* computes the average number of inhabitants annually afflicted with this disease to amount to five or six hundred. *M. Senac*, late physician to the King of France, adds his testimony concerning the frequency of the disease at Versailles. *Dr. Warren* enumerates thirty instances among the servants and domestics of an English nobleman, during his residence at Hanover, all occasioned by the same cause. It has been observed with surprise, that at Surinam, the Europeans who drank French wines are extremely liable to this disease, while the natives, who refrain from this beverage, entirely escape.

If we turn our attention to our English made wines, I fear they will by no means be found clear of suspicion. In Graham's art of making British wines, are the following choice receipts:

1. *To soften green wine.*

Put in some vinegar wherein litharge has been well steeped, and put a quart of it into a tierce, and this will mend it, in summer especially.

2. *To hinder Wine from turning sour.*

Put a pound of melted lead in fair water into your cask pretty warm, and stop it close.

From which it appears that William Graham was deep in the mystery of vintners: and his book, having gone through no less than six editions, may be reasonably supposed to have revealed the dangerous secret of those adepts in iniquity, to at least three thousand innocent families, together with their friends and connections! But to estimate the sum total of mischief accruing from the numerous receipt-books of this stamp published within these fifty years past, "highly necessary (as the editors gravely observe) to ALL FAMILIES," entirely baffles calculations! For, according to the sage advice of those worthy authors, scarcely any family is now found without one or more of their "faithful guardians of health, or trusty monitors in every thing relating to food or physic!"

To supply the public with an effectual antidote to the various poisons conveyed in these books, and disseminated far and wide among the people, would be worthy the pen of the ablest chemist, and every life thus rescued from their pernicious effects would well intitle him to a civic crown.

The colic of Poitou, is a prevailing disease in the West Indies, particularly among those who drink rum. Some attribute it to the newness of the spirit, others to the acid juice of the limes which generally accompanies its use. But the former, when genuine, is inadequate to the effect; the latter, instead of producing the disease, is found rather to be a remedy.

Distilleries, and even breweries, with all their apparatus, ought to undergo a narrow inspection, as acids, and even their effluvia, are capable of corroding lead Therefore the leaden worms, spouts, gutters, in a word, every utensil containing that metal, ought to be viewed with a jealous eye. Nor ought the inquiry to be confined to these places alone: for if we extend our views to our wine and cyder-presses, dairies, kitchens, and store rooms, we shall probably meet with much to be complained of—much to be reformed. Whether the apothecary's shop, or even the elaboratory of the chemist, will bear a very close scrunity, may perhaps be justly doubted. For be it remembered, that not only lead and pewter, but also the tinning of copper vessels, the solder containing a mixture of lead, and the glazing of earthen ware being a calx of lead, are all liable to be corroded by acids, or even expressed oils.

In making cyder, I know it is pretended that the quick passage of the apple-juice through spouts or gutters of lead does not afford time for any impregnation. But this is a mistake for the leaden surface being often wetted, and alternately dried by exposure to the air, contracts minute particle of ceruss, or rust of lead, ready to be washed off, and dissolved in the course of the process. Sometimes the juice is even suffered to ferment in vessels lined with lead, which still greatly increases the danger. An instance of this kind lately occurred at Frome:—A family of three persons drank freely of this liquor, and were at length seized with the colic of Poitou. The master who drank the greatest quantity, suffered most, and his disease terminated in a fatal palsy;—the wife and maid-servant, who drank less, underwent similar symptoms, but escaped with life.

Milk and Cream.—The vessels of our modern dairies consist chiefly of lead, or earthen-ware glazed with a calx of that metal, both which are liable to be corroded by weak acids, and oily substances. Whether the milk and cream are suffered to remain in them long enough to acquire an impregnation of the metal has not been determined: but the acid odour which strikes the nostrils on entering certain dairies, especially in a warm season, is at least sufficient to excite suspicion, and to put the public on their guard till the safety of these vessels be more fully ascertained. The wisest step would be to return to the ancient wooden bowls of our ancestors, than which nothing can be more perfectly safe or free from suspicion.

Vinegar, Pickles, Acid Fruits, &c.--These act powerfully upon lead and its preparations, and, it is to be feared, often acquire an unsuspected impregnation of that metal in various culinary processes. Thus when vinegar is distilled in a pewter alembick, or passes through the worm of a common still, it carries with it a portion of the metal. The process ought therefore always to be performed in stone or glass vessels.—It is a very common, but dangerous mistake, to suppose that vinegar may be trusted to glazed earthen-ware with perfect safety, since vegetable acids act more forcibly on the calces of lead than on the metal itself.

Yet glazed earthen-ware, in a variety of forms, constitutes the vessels in which pickles are kept: in which acid fruits are preserved; and in which various kinds of tarts are baked. It is moreover curious to observe, that a marked preference is given to them by most frugal housewives, who find by experience that such vessels occasion a material saving in the article of sugar:—but they remain to be told, that the increased sweetness proceeds from the acid of the fruit being blunted by its union with the glazing of the vessel, which has a more pernicious tendency than they seem to be aware of. For certainly these good ladies would not designedly sweeten our viands with sugar of lead!

Here it ought to be remarked, that there is a material difference in the mode of glazing vessels. The glazing of *stone* ware and china being a vitrification of the clay, is indissoluble in acids, and therefore such vessels are perfectly safe; while the glazing of ordinary earthen-ware, consisting of a calx of lead, is easily acted upon by acids, and yields a noxious quality.

The same remark is in some measure applicable to vessels lined with tin. Pure block-tin, it is true, gives no impregnation to vinegar or acid juices, but the generality of tinned vessels contain a considerable alloy of lead, besides what is used in the solder. This is very distinguishable even by rubbing a finger over them, which will soon acquire a blackish hue from the lead; a circumstance worthy notice, as too much confidence is generally placed on the safety of tinned vessels. Not to mention the danger of the tin lining soon wearing off, and leaving a copper surface exposed. Hence the fatal accidents that have ensued from acid sauces and gravy soups standing too long in such vessels, and acquiring thereby an impregnation doubly dangerous. For here the poison of lead, and verdegris, combined their united forces to undermine the human frame!

Saturnine Medicines.—Goulard's famous extract of Saturn, and his vegeto-mineral water, seem to stand at the head of the list of cooling sedatives; and though perhaps inferior to an aqueous solution of the sugar of lead, are nevertheless far more fashionable remedies. Applications of this nature may, it is true, be used with tolerable safety where there is a whole skin, and its texture sufficiently entire to prevent absorption. But where it is soft and spungy, or the scraf skin stripped off, or ulcerated, the poison of course will be more liable to be absorbed into the system, and to produce its pernicious effects. To prevent the tender skin of infants from being excoriated, nurses seldom fail to sprinkle them plentifully with white lead. Hence perhaps the severe gripes and fatal convulsions which so often ensue, though generally attributed to other causes.

Children's play-things are commonly painted with a composition of red or white lead; but how often do we see the smiling innocents suck within their lips those pernicious toys, while the unsuspecting parents look on with apparent satisfaction? The application of an ointment with litharge, or white lead, to nurse's sore nipples, often proves fatal to sucking infants: twelve instances of this sort are recorded by Sir George Baker to have happened at Dartmouth.—Our common red-wafers receive their colour from red lead. When these are accidently picked up by tame birds, they soon prove fatal, which ought to be a caution to those inconsiderate persons who are fond of not only chewing, but swallowing them.

Painters in Water-colours are equally reprehensible for incautiously moistening their pencil with their lips, and frequently holding it in their mouths a considerable time. Thus the saliva, repeatedly imbued with a slow poison, is insensibly swallowed from day to day, till at length the health becomes visibly impaired, without the cause being suspected, unless the colic or palsy should supervene.

Cosmetics—Were it permitted us to penetrate the secret recesses of the toilet, and to explore at leisure the nature of the mysterious articles which administer so conspicuously to artificial beauty, we should probably find that some of the most celebrated cosmetics consist of preparations of lead, mercury, or bismuth.

Carmine, or harmless rouge, (as the ladies are pleased to term it,) is a preparation of cochineal in nitrous acid, with some other ingredient which is kept a profound secret. This favourite composition, which is used by some ladies to give the roseate bloom to their countenance, being prepared with a strong mineral acid, is perhaps not altogether so very innocent as they imagine: besides, its excessive dearness renders it an object of adulteration; and vermillion, (a preparation of mercury,) though an humble imitation, affords a cheap and inviting ingredient to mix with it. To this, in its simple or combined state they are generally beholden for their roses, while a calx of lead, or, what is equally pernicious, the magistery of bismuth, gives the last polish to the lily-whiteness which so dazzles our eyes.* It is thus our modern Hebes attempt to preserve a perpetual bloom, and to hold wrinkles and old age at defiance. But alas! alas! these pernicious ingredients, although only used externally, are liable to be imbibed at every pore, and thence convey a slow poison into the system highly injurious to health; and, what may appear still more formidable, destructive to beauty! For dismal to relate! the cold cream, the *pommad divin*, or whatever specious titles such compositions may assume, at last betray their trust; and, instead of beauty, produce real deformity! The artificial roses soon fade, the angelic whiteness contracts a dingy brown, when the mask falls off, and the spectre stands confessed.† Strange that British ladies, to whom nature has been so bountiful, should distrust their native charms, and have recourse to such wretched substitutes of art! Is it not truly mortifying that they should thus stoop to adorn, or rather disguise their persons, at the expense of their health!

---

* This poisonous composition is generally dignified by the pompous title of pearl powder, and sold as perfectly innocent. It has, however, proved fatal to some, and ruined the health of many others, without being even suspected. I am credibly informed, that those ladies who are in the habit of enamelling their faces necks, and bosoms, with this white paint, generally fall early victims to their own indiscretion; but particularly so if they happen to undergo the small-pox, even by inoculation. Nor is this to be wondered at; the pustules being unable to penetrate outwardly through the enamelled skin, the virus recedes inwardly, and preys on the vital organs.

† Particularly on exposure to the sun, a hot fire, or sulphureous vapours.

But to quit so humiliating a subject—If what has been offered be not sufficient to put them on their guard, more would be ineffectual. However, before I conclude, there is one simple cosmetic I can venture with confidence to recommend to the ladies, as a perfectly safe, cheap, and efficacious substitute for all the pernicious tribe above-mentioned, and which may be freely used without any risk of detection; a cosmetic which boasts the highest antiquity, and is perpaps the only true one acknowledged by nature. It is not only innocent, but highly conducive to health. It clears the complexion far beyond the milk of roses; and when accompanied with regular hours and brisk exercise in the open air, diffuses over the countenance a more animated bloom than the finest rouge. It is now needless to add, that this grand secret is no other than cold spring water!

To point out a certain method of detecting the poison of lead, in whatever form it may be found lurking, next demands our consideration. This happily is practicable; but the principle on which it depends cannot be clearly understood but by those who are tolerably versed in chemistry. The fact, however, is highly interesting to the public, and therefore ought to be universally known. In whatever substance then, this insidious enemy may lie in ambush, whether in wine, cyder, food, medicines, or cosmetics, the following test, like the touch of Ithuriel's spear, instantly brings the culprit to light.

Take of yellow orpiment in powder...1 oz.
—— of quick-lime fresh from the kiln..2 oz.
—— of distilled water boiling hot...20 oz.

Let the whole stand twenty-four hours in a close vessel of glass or porcelain, stirring the mixture with a wooden spatula. Then carefully decant the clear liquor, and strain it into a bottle, which must be well secured and kept for use. Frequent exposure to air, destroys its transparency.

1st. If a few drops of this liquor be put into a glass of wine or other suspected liquor, and no change of colour, or visible alteration ensue, be assured such liquor is free from lead, or metallic adulteration.

2dly. If the liquor contain the slightest impregnation of lead, as litharge, or sugar of lead, (the substances generally employed for the purposes of the adulteration) on adding the test a *precipitation* will ensue of a dusky brown sediment

3dly. If the suspected liquor be high coloured, it must be previously diluted with triple its quantity of distilled water, or the change will not be sufficiently *perceptible*: and care must be taken to add deliberately from three to six drops only, attentively marking the *alteration*. A larger quantity may re-dissolve the precipitate, and soon render it invisible.

4thly. As iron and other metals may produce a change of colour and precipitation, if any doubt should arise concerning the nature of the precipitate, let a quart of the suspected liquor be evaporated in a large crucible to an extract, and afterwards calcined in a red heat. When it is cold the metallic particles may be discovered in their proper form in the ashes. Or the precipitate may be examined without a tedious evaporation, if it be placed on charcoal, and the flame of a candle be directed upon it with a blow-pipe, by which it may soon be reduced to its metallic state.

5thly. If to any medicine, perfume, or cosmetic in form of powder, liquid, or ointment, a few drops of this liquor be added, a brown colour will soon appear, if any impregnation of lead be present in the composition.

6thly. The vitriolic acid and saccharine acid may also be employed to precipitate lead from liquors, but the above test appears to me preferable to any thing of the kind yet discovered.

Smelters, plumbers, painters, and manufacturers of red and white lead, in carrying on their dangerous operations, often perceive a sweetish taste, attended with a slight nausea, or sense of faintness, evidently proceeded from the sugar of lead. But this approach to disease is too commonly neglected till health is completely ruined. Such persons should, previous to their going to work early in the morning, instead of drinking a pernicious dram, take a spoonful of castor oil, or oil of olives, and use fat oleaginous foods. For their further protection they ought to avail themselves of a free ventilation to carry off the noxious vapours, and also to breathe through mufflers composed of double cloth or flannel well dipped in alkaline ley, and also be careful to throw off their dirty clothes the moment their work is over. By these precautions they probably might be in a great measure preserved from the poisonous fumes that daily surround them. The like method of prevention is no less applicable to those who are occupied in other pernicious minerals, as grinders of verdegris, gilders in water-colours, workers in quicksilver, &c.

To the Proprietors of the Belfast Magazine.

GENTLEMEN,

A CORRESPONDENT of yours, under the signature Y., objects to the Lancasterian system of education, that "it is too superficial, giving the children the *appearance* of learning, without the *reality*. That the mere mechanical knowledge of the first four rules of arithmetic is not sufficient, that the reading lessons are too difficult for learners, and that the spelling lessons are very defective, there being but 18 cards of spelling lessons"

In the Magazine for January, he says, an attentive observation of the lessons and of the progress in education, made by children in a school, conducted in *many respects* on the Lancasterian plan, has convinced him that unless there is a greater variety of lessons than is generally used in Lancasterian schools, the children must be superficial in their attainments—" and few children can have a sufficient knowledge of simple multiplication, by learning 12 sums, each sum containing 7 figures."

The first objection made by this writer is by far the most serious, as were it to hold good, all the expense and labour incurred by establishing Lancasterian schools, would be completely thrown away, and the glowing expectations of their founders and advocates entirely disappointed; for if the system gives only the *appearance* of knowledge, without the *reality*, it can be of no manner of use—it being the reality of knowledge alone which can be considered useful.

My intention is to endeavour to show that this is not a real representation of the Lancasterian system of education—and that so far from giving the *appearance* of knowledge only, it gives even more of the *reality* than any other system hitherto invented.

As to the lessons being too few in number, this certainly should not be attributed to the system as a defect,